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Ethnic Density is Unrelated to Incidence of Schizophrenia

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Data deriving from the Mental Health Enquiry were obtained from the Department of Health and Social Security (DHSS) for all 186 000 admissions in England in 1981 to test the 'ethnic density hypothesis'. This hypothesis has been used to explain variations in rates of mental illness between ethnic groups in other countries, and suggests that there is an inverse relationship between the size of ethnic groups and their admission rates. The data analysed in the present paper for the main foreign-born immigrant groups to England not only failed to support the ethnic-density hypothesis, but in some cases, showed a significant positive relationship between group size and admission rates. Some possible reasons for these findings are explored.

In one of the classic studies in psychiatric epidemiology, Faris & Dunham (1939) observed that the rates of admission to mental hospitals for Blacks with a diagnosis of schizophrenia were much higher in areas of Chicago where Blacks were not very numerous, than in areas where they were numerous. The same applied to Whites – there was a negative correlation between the proportion of white residents in a neighbourhood and the white rate of admission for schizophrenia. Interestingly, this did not hold for any other diagnoses. Neither did it apply to a comparison of native-born and foreign-born ethnic densities in the Faris & Dunham study, but as Mintz & Schwartz (1964) subsequently pointed out, it was simplistic, and probably misleading, to treat the 'foreign born' as an ethnic unit. Mintz & Schwartz's own data showed quite clearly that there was a significant inverse correlation between the rate of admission for schizophrenia of the Italian born, and the proportion of the population who were Italian born, in 27 neighbourhoods in Boston, Massachusetts ($r = -0.33$; $P < 0.05$) which remained significant even when socioeconomic status of neighbourhood was accounted for.

These findings gave rise to what has become known as the 'ethnic density' hypothesis, namely that there is an inverse correlation between the incidence of mental illness in a particular ethnic group and its size relative to the total population. This is, in fact, a special case of Wechsler & Pugh's (1967) more general hypothesis that people with a particular personal characteristic who are living in communities where that characteristic is less common will have a higher rate of psychiatric hospital admissions than people with the characteristic living in communities where it is more common. In other words "people who do not 'fit in' a community should have higher rates than those who do" (Wechsler & Pugh, 1967, p. 220). The basis of the fit hypothesis is that "social isolation or marginal social membership serve as risk factors, magnifying the impact of social change or life events and thereby enhancing the probability of illness onset. Marginal social membership may take the form of belonging to a group that forms a numerical minority in a given neighbourhood" (Rabkin, 1979, p. 1563). Wechsler & Pugh demonstrated that their hypothesis held for age groups, marital-status groups, and social class, but did not test it for ethnic-group differences, and found no support for the hypothesis when comparing foreign-born with native-born Americans. A recent analysis of data on marital status and mental-hospital admissions in the UK has shown that a version of the 'fit' hypothesis is valid here too (Cochrane, 1988).

However, several other researchers have taken up Wechsler & Pugh's hypothesis and applied it to the density of various ethnic groups. In New South Wales, Kraus (1969) found a strong and significant inverse correlation between the relative sizes of groups migrating from various countries and their psychiatric admission rates for both males (-0.67) and females (-0.82).

The same results have been obtained from various studies in the USA – that of Mintz & Schwartz has already been mentioned. Muhlin (1979) found significant inverse correlations ranging from -0.25 to -0.36 between ethnic density and psychiatric admissions in New York City Health Areas for each of the Irish, German, Polish, Russian, and Italian born. Rabkin (1979), also using New York City data, found that risk of hospital admission

was clearly increased by living in an area where one's ethnic group was in a very small numerical minority. This held true for Blacks, Puerto Ricans, and also for Whites. Some of these studies examined rates of admission for schizophrenia, while others looked at admissions for all diagnoses combined. Their results point to an explanation for the variability in rates of mental-hospital admissions found for immigrant groups in Britain based upon the variation in the size of the population upon which the rates are based. It could also account for the very high rates of admission for schizophrenia found in some immigrant groups (Cochrane, 1983, 1987).

Method

Table I shows the size and proportion of the total population of each immigrant group in England numbering over 50 000 in 1981, and sex-specific rates of admission for schizophrenia. As can be seen, some of the largest 'immigrant' groups cannot be considered as either foreign-born or an ethnic minority. Those born in Scotland, Wales, and Northern Ireland are British, and have many similarities in cultural terms to the English. Many of those from Germany are the sons and daughters of British servicemen stationed there, and many of those born in the USA are the offspring of expatriot British businessmen, workers, and professionals on more-or-less extended visits to that country. All these groups were, therefore, excluded from subsequent analysis. This left nine foreign-born groups whose data were included, and these are marked with an asterisk in Table I.

Two main sources of data were used for the analyses. The Statistical Branch of the Department of Health and Social Security (DHSS) made available selected aspects of the information they routinely collect on the HMRI (psych.1/P) Form completed at admission for all patients admitted to mental hospitals in England in 1981. In that year, there were 186 000 admissions, and for each case, information was obtained on: country of birth; diagnosis; age; sex; whether first or readmission; and regional health authority (RHA) in which admitted. For such a large data base, there was no way of checking on the reliability of these data, and there are known to be problems associated with the definition and recording of admissions as first or subsequent. However, as data for first and all admissions are explored in this paper it is unlikely that any serious errors will be introduced by this unreliability.

All the results reported are based on the country of birth, not ethnicity. Some proportion of those born abroad but living in England will be English ethnically and, equally, some of those born in England will belong to minority ethnic groups. Data are not available on hospital admissions, nor the general population, broken down by ethnic group. Allowance was made for those patients for whom country of birth was not recorded at admission, as in Cochrane (1977).

The year 1981 was chosen for analysis, as this was the last census year, and this provided the second major data source. It is only in census years that detailed estimates of

TABLE I

Proportion of total population of England in 1981 born in 15 countries and rates of admission for schizophrenia

Country of birth	*Number resident in England: thousands*	*Percentage of total*[1]	*Admission rates per 100 000*			
			Males		*Females*	
			First	*All*	*First*	*All*
England	41 084	89.71	9	61	9	58
Scotland	731	1.60	10	75	15	88
Wales	573	1.30	10	59	11	69
*Irish Republic	567	1.24	18	158	22	174
*India	379	0.83	11	77	18	89
*Caribbean	292	0.64	39	259	35	235
*Pakistan[2]	227	0.49	19	94	12	32
Northern Ireland	202	0.44	18	103	17	111
Germany[3]	159	0.35	11	27	7	64
USA	104	0.23	13	58	6	33
*Kenya	100	0.21	19	100	6	57
*Italy	89	0.19	16	64	13	138
*Poland	86	0.17	24	132	34	212
*Cyprus	82	0.16	18	124	8	62
*Hong Kong	52	0.11	7	65	29	50

1. Total population in 1981 – 45 771 956.
2. Includes Bangladesh.
3. East and West.
* Included in correlational analyses

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the population broken down by country of birth and age can be obtained, and then not until several years after the census is completed (Office of Population census and surveys, 1983). The decennial census is widely regarded as the most reliable source of information about the size of the immigrant population of Britain and, indirectly, the size of minority ethnic groups also (Commission for Racial Equality, 1978; Demuth, 1978; Peach, 1982). The population data were required in order to calculate rates of admission for England as a whole and for Regional Health Authority areas separately. All data are expressed as rates per 100 000 population at risk.

Results

There are two obvious ways of testing the ethnic-density hypothesis with these data. Either correlations between group size and admission rates can be calculated within a defined geographical area (e.g. England), or rates of admission can be correlated with the size of an ethnic group across different areas. Both strategies were adopted here.

There was no support for the ethnic-density hypothesis when correlations between size of group and rates of admission were calculated across England as a whole. All the correlations were, in fact, positive rather than negative. What is more, those for male admissions for all diagnoses achieve statistical significance, but in the opposite direction to that predicted by the ethnic-density hypothesis ($\rho = 0.70$ for first admissions and 0.65 for all admissions, $P < 0.05$ in both cases).

Perhaps England is too large an area to allow the ethnic-density hypothesis to be tested fairly. The analysis was repeated for the West Midlands Regional Health Authority only, but for all admissions, as there were too few first admissions in some groups to yield reliable data. The hypothesis fared no better with the West Midlands data than it had with data from the whole of England. This time there were small but insignificant negative correlations for males, but a substantial, significant, and positive correlation between ethnic density and female rates of schizophrenia ($\rho = 0.68$, $P < 0.05$).

Turning to the alternative strategy of looking at relative mental-hospital admission rates **within** ethnic groups to see how these varied with the density of these groups in different RHA areas of England, there was at least some minimal support for the ethnic-density hypothesis. This analysis was performed for the four largest foreign-born groups, as only they had sufficient numbers in each RHA to make analysis meaningful (those born in Ireland, the Caribbean, India, and Pakistan). Taking the data for each nativity group separately, all the correlations were small and non-significant, with the exception of that for males born in the Republic of Ireland, where it was very high, negative, and extremely significant (-0.86, $P < 0.01$). This result conforms exactly to the ethnic-density hypothesis; in regions where relatively few Irish-born people live, the Irish male rates for schizophrenia are much higher than in regions where they constitute a larger proportion of the population. Before evaluating the importance of this correlation, the possibility that, perhaps coincidentally, Irish males tend to live in areas in which all nativity groups, even the English born, have high rates of admission for schizophrenia should be considered. A correlation between English male rates of schizophrenia and the density of the Irish population across RHA regions showed this not to be the case – the correlation was positive and not significant ($\rho = 0.20$). As a large number of correlations have been computed, it is possible that chance alone might throw up one significant coefficient supporting any particular hypothesis.

Discussion

With the exception just referred to, the Irish-born male rates of admission for schizophrenia, our data do not support the ethnic-density hypothesis. Yet this same hypothesis has received strong and repeated support from studies done in the USA and in Australia. Why might this discrepancy exist? No definitive answer can be given, but several possibilities arise.

1. There may be genuine differences in the psychological significance of ethnicity, and hence ethnic density, between England and other parts of the world. It could be, for example, that ethnicity is not such an issue in England as in the USA and possibly Australia, as there is more general integration of migrants into the majority host society here. If this were the case, then low ethnic density would not have the same deleterious effects on mental health as is found elsewhere. However, both the everyday experience of immigrants to England, especially non-white immigrants, and the overwhelming evidence from research that is available, show clearly that ethnicity and race are major issues in Britain, that many minorities encounter prejudice and are discriminated against on racial grounds, and that acceptance and integration has hardly begun (Brown, 1984; Reicher, 1986; Scarman, 1982).

2. The aggregate level of analysis in the present study is too gross to show the effects of ethnic density. It is possible that the number in one's own ethnic group living in the same street, or working in the same factory or office, is psychologically more salient than the number of one's own ethnic group in the country as a whole, or even in an RHA area. While *a priori* this seems a very reasonable argument, it can be pointed out that Kraus (1969) found highly significant negative correlations between size of immigrant groups and psychiatric admission rates in New South Wales. The total population of New South Wales is similar to that of the West Midlands and its geographical area is many times greater. However, it is quite obvious that a finer-grained analysis would be well worth undertaking, but unfortunately data to make this possible are not available.

3. Country of birth is not synonymous with ethnicity, so therefore there might be 'true' ethnic

densities different from those indexed by taking country of birth as the criteria. It could be that the growing numbers of second-generation members of minority ethnic groups (who are identified here as English) are dispersed differently from the first generation, who are identified as foreign born. The evidence, however, indicates that this is not the case. A comparison of the geographical distribution of first- and second-generation members of ethnic groups show that they overwhelmingly live in the same regions of the country (Office of Population Censuses and Surveys, 1983).

4. Similarly, it could be argued that mental-hospital admission rates are not a good index of the prevalence of mental illness. While it is clearly the case that admission rates considerably underrepresent true prevalence, the only way this might bias results in this study would be if the underrepresentation was systematically related to the size of minority groups. We would need evidence that the larger minority groups send more of their ill members for hospital treatment than do the smaller groups, in order to explain the positive correlations found between density and admission rates. This seems inherently unlikely, especially for schizophrenia, where it is generally accepted that most, if not all, cases find their way into treatment at some stage.

5. The published studies are unrepresentative of all the studies that have been done. There is no denying that studies that yield positive results (i.e. which support an intrinsically interesting hypothesis) are much easier to publish than studies where the null hypothesis cannot be rejected. This leads to a very distinct bias in the literature as 'failures to replicate' do not surface, and hence studies with positive outcomes are not challenged. This is entirely speculative, but it does seem unlikely that such a potentially interesting hypothesis has been examined on so few occasions since Faris & Dunham's study appeared in 1939.

Returning to the negative correlation between ethnic density and rate of admission for schizophrenia in Irish-born males, there is a sense in which the support found for the ethnic-density hypothesis among Irish-born males fits in with the picture painted by Murphy (1975, 1977), Scherper-Hughes (1977), and Walsh (1962), of the aetiology of schizophrenia in rural Ireland. They suggest that the only relief some Irishmen can find from stressful life-events is through heavy drinking. A positive (albeit non-significant) correlation between alcoholism rates and ethnic density for this group gives some support to this idea.

References

BROWN, C. (1984) *Black and White in Britain: The Third PSI Survey*. London: Heinemann.

COCHRANE, R. (1977) Mental illness in immigrants to England and Wales: an analysis of mental hospital admissions, 1971. *Social Psychiatry*, **12**, 25–35.

—— (1983) *Social Creation of Mental Illness*. London: Longmans.

—— (1987) The mental health of ethnic minorities. In *Clinical Psychology: Research and Developments* (ed. H. Dent) London: Croom Helm.

—— (1988) Marriage, separation and divorce. In *Handbook of Life Stress, Cognition and Health* (eds S. Fisher & Y. Reason). Chichester: John Wiley.

COMMISSION FOR RACIAL EQUALITY (1978) *Ethnic Minorities in Britain: Statistical Background*. London: C.R.E.

DEMUTH, C. (1978) *Immigration: A Brief Guide to the Numbers Game*. London: Runnymede Trust.

FARIS, R. E. & DUNHAM, H. W. (1939) *Mental Disorders in Urban Areas*. Chicago: University of Chicago Press.

KRAUS, J. (1969) Relationship of psychiatric diagnoses, hospital admission rates, and size and age structure of immigrant groups. *Medical Journal of Australia*, **2**, 91–95.

MINTZ, N. L. & SCHWARTZ, D. T. (1964) Urban ecology and psychosis: community factors in the incidence of schizophrenia and manic depression among Italians in Greater Boston. *International Journal of Social Psychiatry*, **10**, 258–266.

MUHLIN, G. L. (1979) Mental hospitalization of the foreign born and the role of cultural isolation. *International Journal of Social Psychiatry*, **25**, 258–266.

MURPHY, H. B. M. (1975) Alcoholism and schizophrenia in the Irish: a review. *Transcultural Psychiatric Research*, **12**, 116–139.

—— (1977) Migration, culture and mental health. *Psychological Medicine*, **7**, 677–684.

OFFICE OF POPULATION CENSUSES AND SURVEYS (1983) *Census 1981: Country of Birth: Great Britain*. London: HMSO.

PEACH, C. (1982) The growth and distribution of the black population in Britain 1945–1980. In *Demography of Immigrants and Minority Groups in the United Kingdon* (ed D. A. Coleman). London: Academic Press.

RABKIN, J. G. (1979) Ethnic density and psychiatric hospitalization – hazards of minority status. *American Journal of Psychiatry*, **136**, 1562–1566.

REICHER, S. (1986) Contact, action and racialization: some British evidence. In *Contact and Conflict in Intergroup Encounters* (eds M. Hewstone & R. Brown). Oxford: Blackwell.

SCARMAN, LORD (1982) *The Scarman Report*. Harmondsworth, Middlesex: Penguin Books.

SCHERPER-HUGHES, N. (1977) *Saints, Scholars and Schizophrenics – Mental Illness in Rural Ireland*. Berkely: University of California Press.

WALSH, D. (1962) Cultural influences in psychiatric illness in the Irish. *Journal of Irish Medical Association*, **4**, 62–68.

WECHSLER, H. & PUGH, T. F. (1967) Fit of individual and community characteristics and rates of psychiatric hospitalization. *American Journal of Sociology*, **73**, 331–338.

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